

- Ben Greenfield:* On this episode of the Ben Greenfield fitness podcast.
- John Doolittle:* He was essentially paralyzed, but because it was a brain injury of something with the autonomic nervous system, we were able to help get things turned on, on his left side.
- Steven Munatones:* And this is what he recommends to people who have lower back issues, people who, for whatever reason, they don't want to do a sit up, but they can walk with a book on their head.
- John Doolittle:* Gone are the days of, hey, I'm going to work legs hard today and I can't do them again for three or four days. You can do them again, same day or the next morning. no problem.
- Ben Greenfield:* Health, performance, nutrition, longevity, ancestral, living, biohacking, and much more. My name is Ben Greenfield. Welcome to the show. All right. You guys have been asking, so here you go. KAATSU training. I've talked a lot about blood flow restriction training before. It's different than these KAATSU Japanese devices. So, I got a couple of cats on the show who have been immersed with some of these Japanese researchers, bad-ass former Navy SEAL who uses this a ton in his training.
- And I've been using the KAATSU that I have now on some of the walks that I go on, during swims, during workouts. Using it in a very similar ways you're going to discover on this podcast. These are incredible, incredible ways to train, this idea of restricting or not really occluding or restricting, but you'll hear. You'll hear. I should I should just stop talking and let my guests explain to you.
- So, this is the big KAATSU podcast and it's brought to you by Kion. If you want to throw a little something into the mix, here's something cool. If you trap amino acids in the blood, I actually have a really famous bodybuilder I'm getting on the show – I'm not gonna tell you who – in a couple of months. We're going to talk about some of the research he's done on essential amino acids. If you can trap them in the blood locally during a workout, they actually cause a huge increase in muscle protein synthesis.
- So, they pair perfectly with KAATSU or BFR training. If you take like ten grams or so of essential amino acids, you'll blast your results even more through the roof when you're doing this type of training. And at Kion, our most popular product are essential amino acids. So, they're perfect, perfect for pre-KAATSU training. all of our stuff at Kion is research backed. It's real world tested and I stand by every single product over there. So, you get a 20 percent

discount on the aminos or anything else at Kion if you go to getkion.com.

That's getkion.com and use code BGF20. That gets you 20 percent off site-wide at getkion.com this podcast is also brought to you by Joovv. Joovv makes these photo biomodulation panels that a lot of guys know about already. If you shine them on your balls for 10 to 20 minutes a day, you get big increases in total and free testosterone because they interact with the **latig** cells in your testes to, assist with ATP production in that department. They're wonderful for wound healing, for scars, for wrinkles.

I shine it on my face when I do my clay mask every week. I got a little Joovv Go up in my office that I use for that. You can use them before sleep to simulate sunset. You can use them in the morning to simulate sunrise and regulate your circadian rhythms. The use case for these Joovv red light panels is just, it's all over the place. Tons and tons of research studies on these things. Well, I should say on photo biomodulation.

There are not tons and tons of research studies on the Joovv panels themselves, but in my opinion, and you can go listen to my podcast with them, they're the best light panels because they put out an incredible amount of power and give you a dose of red light in a very short treatment time. So, they also have incredible customer support.

They'll help you put together the perfect kind of Joovv panel I guess configuration that works best for what you're going to use it for, whether it's travel or your office or your bedroom or wherever, and they're going to give everybody who gets a Joovv a free copy of my book, *Boundless*. You just go to Joovv.com/ben that's Joovv.com/ben. Get a free copy of my book, *Boundless* while the supplies last, and hook yourself up with a fun little Joovv device.

All right, folks, this is it, the official KAATSU training episode. If you don't know what KAATSU is, don't worry. It's not some funky Japanese Pop Tart. It's a lot more than that. We're gonna get into it on today's show. I have addressed in the past on multiple podcast episodes the concept of what you may know as a blood flow restriction training, which is not exactly the same as KAATSU. We'll get into that. And also, occlusion training in other podcast episodes. I've touched on it.

I've talked with folks like Dr. Mercola about it. I've mentioned how much I'm using it these days, especially being at home. At the time

this is being recorded, we're on quarantine for this coronavirus and man, one of my top tools at home right now is KAATSU training with body weight, not only because I can maintain muscle and get a mitochondrial and satellite cell response with a little less inflammation, but also because I can't go to the gym where all the heavy weights are, but I can simulate that with this type of training that we're going to talk about in today's show, because I've been wanting to do a big deep dive on this for a long time, and I finally hunted down two of probably the top experts who exist, or at least they're up there when it comes to KAATSU training.

So, everything that I talk about in today's show, you're going to be able to find at BenGreenfieldFitness.com/KAATSU podcast, and it's spelled – brace yourself – K-a-a-t-s-u. So, it's BenGreenfieldFitness.com/KAATSUpodcast for the show notes, and I have two guests. Like I mentioned, I've got two guests. One guest came to my house about three months ago, brought me through this super fun, mildly brutal KAATSU workout out in my home gym and he showed me the ropes on this thing, and he has trained all over the globe.

He left a unit at my house and I actually have it on right now. So, you guys are gonna get to hear in real time how this training goes also. His name is John Doolittle. He graduated from the U.S. Air Force Academy back in the 90s. He served in the U.S. Navy for 25 years where he was deployed as an officer in the SEAL teams. That's right, he's a Navy SEAL. This guy's a bad-ass. He's been in Kosovo, Bosnia, Iraq, Afghanistan.

He retired as a Navy captain after his last assignment and then went on to become a certified KAATSU master instructor. It's pretty cool actually the type of applications he's found with his background in diving, particularly with using this thing for swimmers, which I think is really cool. And I began to use it for my swim workouts. I recently took the unit to India where I had access to a lot of pools in the hotels I was staying in, and I was doing KAATSU pool-based workouts every day, and holy cow.

Amazing, amazing. A huge game changer for me to strap these bands on and not just do resistance training, but also hit the Aerodyne or hit the pool. Totally, totally epic way to train. So, my other guest today, in addition to John Doolittle, and oh, by the way, John, say hi, so people know what your voice sounds like versus Steven's.

John Doolittle:

Hey, great. Thanks, Ben. This is John. Pleasure to be here, man.

Ben Greenfield: All right, so that's John's lulling U.S. Air Force Academy voice that you can hear right there. And my other guests is Steven Munatones. Am I pronouncing your last name right, Steven?

Steven Munatones: Close. It's Munatones.

Ben Greenfield: Steven Munatones. So, Steven has actually studied with D. Sato, and if you don't know who Dr. Sato is, he's the dude who invented KAATSU. If you Google and you look up a picture of him, he's literally like the rippest youngest looking old dude you'll ever see, maybe some of those Japanese genes. I suspect part of it might be the KAATSU training, but Steven has had a chance to train under Dr. Sato, and he has actually been involved with KAATSU also in the World Open Water Swimming Association where he's been helping to coach for years and help them achieve some national championships or world championships.

He's a Harvard graduate. He's introduced KAATSU to collegiate, to professional, to Olympic athletes, to military special operators. And I know many of my listeners may not be a Navy SEAL or an extreme athlete, but Steven has also really done a good job introducing this into the aging Baby Boomer community. Because as you'll learn on this show, one of the best ways to maintain muscle as you age and even build muscle is this KAATSU training.

So, we're going to delve into all of that and more. But guys, before we dive in, before we dive in, I actually have a KAATSU unit attached to my body right now. And either you guys can answer me this, but I'm right now pushing the on button on it, and what protocol do you recommend I run? 'Cause what a lot of people don't realize, you can do this while you're at your office and get a ton of the benefits we're about to talk about, even if you're not exercising. So, what protocol do you, do you guys advise while we're podcasting.

John Doolittle: Hey Ben, this is John. You got the leg bands on or you got the arm bands on?

Ben Greenfield: I'm rocking the leg bands right now. Maybe halfway through the podcast I'll switch, but leg bands right now.

John Doolittle: Okay, perfect. That's what I'm wearing too. So, have you done any cycles or are you just, did you just put them on? If you haven't

done anything, let's go ahead and start at the group low, which is the lowest cycle that you go.

Ben Greenfield: Okay. All right, so run the pro, press the P button. Run it low. Okay. I'm running a PL1 right now. Is that the one that should be running?

John Doolittle: That's good. That should take about five minutes and then when that's done, just go ahead and go to pro medium and we'll just progress up. Each cycle will take about five minutes.

Ben Greenfield: So, this thing's just like pumping my legs, relaxing, pumping my legs, relaxing. We'll talk about why that's beneficial. So, if you guys hear a little low-level motor in the background, that's this little piece, and should you wonder about how one could throw a motor in a pool, the cool thing about these devices is once you get the pressure on, you can actually untether them, then go exercise without the unit attached.

But if you have the unit attached, it'll actually cycle the pressure on and cycle the pressure off, which is really cool. So, anyways, that all being said, if you guys hear me grunting and groaning or you hear the veins in my legs expanding as I'm getting all swole during the podcast, this is why, so thank you. Thank you, John. And once this five-minute cycle is over, I'll switch to medium, which will give me even higher pressure, right?

John Doolittle: Yep, yep. That's right. Exactly.

Ben Greenfield: Cool. Well, we'll work our way up. All right. So, John, let's start with you. How'd you discover KAATSU? How'd you get interested in this?

John Doolittle: Well, so you hit it already. I was in the Navy for 25 years, and during the career in the teams, in the SEAL teams, I like to say it's not if you get hurt, it's when you get hurt. Everybody gets hurt throughout a career in that line of work, right? So, you know, I'm, I'm an orthopedic mess. I've had 12, 13 ortho surgeries. The way I got introduced to KAATSU was during rehab.

So, throughout the U.S. Special Operations command enterprise, we have physical therapists, trainers, strength coaches, dieticians. We have these people embedded in the various units. And so, my injury that I got introduced to KAATSU was a full thickness tear, supraspinatus rotator cuff tear. So, I had some surgery and the guys

asked me, you know, “Hey, do you want to try this?” And I’m like, well, you know, I’ll try anything if it’ll help speed up the rehab.

And it actually is the same injury I had had six years earlier and I was kinda nervous about it, ‘cause when I had that done that first rotator cuff, it took me like 10-11 months to get all the way back into it. I mean, full range of motion, strength, mobility, swimming, butterfly, all that stuff again. And so yeah. I said, yeah, I’ll try it. They had me at 95 percent strength, agility, at the five-month mark, which that’s when I fell in love with it was the rehab piece. I got better much faster than I was expecting.

Ben Greenfield: So, for you it was basically your rotator cuff healed up super fast and that’s when you became a fan.

John Doolittle: Yeah, yeah, exactly. And I retired two and a half years ago, and so that was like three and a half years ago. So, I’ve been with the company for last two and a half years.

Ben Greenfield: Okay. And what we’ll get in later in this podcast, we’ll get into why you would have healed up so much more quickly using KAATSU. But how about you, Steven? How did you discover this thing?

Steven Munatones: I was actually a volunteer coach with the U.S. National Swim Team and the world championships were in Fukuoka, Japan. I actually just saw an athlete using these bands around his arms, and I said, “What is that?” One thing led to another. At the end of the competition, one of the coaches said, “Oh, I’ll introduce you to Dr. Sato who created KAATSU.” Said great.

After the competition is over, I met Dr. Sato. I was blown away immediately by what I saw, and I asked him, “Dr. Sato, why isn’t the rest of the world doing this?” Keep in mind, one of the kids on that team, on the USA national team was a 15-year-old Michael Phelps. So, we had some studs on that team and nobody had -

Ben Greenfield: Yeah, I’ve heard of him before.

Steven Munatones: Yeah. Nobody had, at least not in the American side, had heard anything about KAATSU. Dr Sato taught me, showed me. And, again, we were speaking Japanese, ‘cause I can speak, read, and write Japanese. And I said, “Dr. Sato, why isn’t KAATSU known around the world?” And he goes, “Well, I don’t speak English and I don’t travel outside of Japan.”

And I said, “Well, you know, I do both of those things and can you teach me?” And he says, “Sure, I'd love to teach it. I'd love to share this with the rest of the world.” And I go, “Great. Do you have a book or something? I could just read it and then learn what you're doing.” And he pointed up at his forehead and he goes, “Well, it's all right here.” And so, literally over the next 13 years, he took me under his wing. I spent a lot of time at the University of Tokyo Hospital with Dr. Sato and the cardiologists there that were doing the cutting-edge research at the time. And then in 2014, Dr. Sato said, “Okay, you're ready. I think you understand KAATSU and let's go.”

Ben Greenfield: Okay. So, that was your guys' introduction to this thing. But now I think probably we should hit the rewind button here for folks because we have not yet really laid this down. Define KAATSU for me. What exactly is KAATSU?

John Doolittle: Well, it's a Japanese word “ka” which means increase, and “atsu” which means pressure. And Dr. Sato, his idea with KAATSU was to increase pressure, thereby expanding and contracting the vascular system and all the hormonal and metabolic and metabolite changes that come with expanding and relaxing vascular tissue. But it's a Japanese word.

Ben Greenfield: Okay. So, in terms of the actual mechanism of action, we can take as deep a dive as you want, explain to me as I'm standing here with these two bands on my legs right now, and of course they could be used in the arms, and I know some real cowboys, myself included, will occasionally, although this is against recommendations, put them on both the arms and legs simultaneously. What is going on right now on a deep physiological level to my body as I have this thing running either while I'm standing here or while I'm exercising?

John Doolittle: I think maybe we come back to that four-limb topic a little bit later, but from a mechanism perspective, you have the leg bands on right now, and I think it's important for your listeners to understand these are not tourniquets, right? These are elastic pneumatic bladders inside these bands.

Ben Greenfield: Meaning to differentiate, sorry to interrupt here, but to differentiate, what you mean by that is I have in the past, and I'm not necessarily opposed to this, I think you need to get some value out of them, sent people to buy like blood flow restriction bands on Amazon.

There's like \$40.00 to \$60.00 you can get these bands that you can use almost like tourniquets to wrap around the limbs, which actually, when I was a bodybuilder, we used to use like big gym towels or the resistance elastic bands at the gym to do this way back in the day. So, like 20 years ago, I was kinda messing around with some of this stuff. But what you're saying is these KAATSU bands are different in a way.

John Doolittle: Yeah, exactly. The idea is never to occlude, to fully occlude.

Ben Greenfield: And what does that mean to occlude?

John Doolittle: So, we don't want this to act as a tourniquet. So, a tourniquet will fully stop blood flow, right? You know, you're on a leg cycle right now. You're on a pro, you're probably around 250 millimeters mercury, maybe a little higher.

Ben Greenfield: Let's see. Right now, I turned it up, actually, I'm at 360 millimeters of mercury now.

John Doolittle: Okay, perfect. So, if you had on a surgical tourniquet right now, and remember a tourniquet doesn't give at all, and you were at 360 millimeters of mercury, you would be very close, and again, I'm not a researcher or doctor, so I don't know the exact pressure. But I know on me, for example, when I had a total knee, they never got my millimeters of mercury on my leg tourniquet, that never got above 400. I think it was in the 300s, and it was full occlusion, so it was time to do surgery, right?

So, that's full occlusion. These bands will actually not occlude at all. They're designed to give, and when the muscle moves, you know, when your quads and your hammies move and expand and relax, the band moves with the muscles, moves with the limb. So, if you're moving, doing any kind of muscular pumping action, the blood is moving in and out. If you're totally passive, you still can't fully occlude or use it as a tourniquet. The blood's always moving. I think that's a key mechanism of action, key point as we kind of dive into this a little bit.

Ben Greenfield: Okay. So, the tubing is actually allowing the blood to move in a different manner than something like a full-on tourniquet would. And that's important why?

John Doolittle: Well, we don't want to stop blood flow. Even if you have the leg bands as tight as they'll go. If you just take your thumb, let's say if you're wearing shorts, and just press into the meat above your

knee, you'll always see that capillary refill. You'll never see that skin tone stay white. You're always going to have blood flow, no matter how tight you make these things.

Ben Greenfield: Okay. All right. Got it. So, you want to maintain blood flow so that you're not completely occluding a limb. And is that because you're able to actually achieve a better muscle contraction when venous flow is not going to be completely restricted? I'm still trying to wrap my head around the benefits of this versus a full-on tourniquet.

Steven Munatones: So, what we're trying to do ultimately is to create as much in engorgement in the capillaries and veins as we can. How we do that is we gradually put a tighter and tighter pressure or greater and greater pressure on the tourniquet. As the vascular beds are filling up with blood, most people will see their skin tone going from, you know, normal color to pink to a little beefy red to, in your case, probably a purple-ish color. The capillaries are fully engorged now.

And ultimately, when you get to what we call the optimal pressure, all of the arterial flow, so the flow from your torso to your limb, whether that's your legs or your arms, equals the outflow, the venous outflow from your legs. At that point, your every muscle, every vascular bed is just engorged in blood.

When you do that and you do slight movement or even contraction, that actually creates a lactate and a variety of other waste products, and that actually begins a cascade of events. First of all, the signals are sent from your muscles up to your brain, specifically your pituitary gland, and that actually begins the process of growth hormone and other things being released into your vascular system.

Ben Greenfield: Like what else in addition to growth hormone?

Steven Munatones: Everything from IGF1, insulin growth factor. If you do it vigorously, let's say you do ten pushups, or let's say you do a short sprint, adrenaline, that's at the systemic level up at your brain. At the local level, you'll have VEGF, vascular endothelial growth factor, which will also lead to nitric oxide. So, there's a variety of things that go on in the body, both locally in the working muscle. So, in your case, your quads, your hamstrings, and your calves, and then also it's happening up at your brain with the release of growth hormone, adrenaline.

Ben Greenfield: Okay. A few questions here. Is this why, when I do so, you know, I've talked about on the show before how I have one of these

Vaspers, which is actually, it's like a cardio workout machine, like a full body cardio workout machine that has blood flow restriction almost like a wrap around. I don't know if they're tourniquets.

I suppose you would define them as that, that circulate cold water through the actual device or when I use these KAATSU training bands to train, is this why I feel almost like this really intense picked me up in mood and alertness after? Would that be the VEGF or is that the IGF secretion? Is it the growth hormone? Do you guys know why there's such a, almost like a psychological effect of these things?

Steven Munatones: Yes, that's actually endorphins, adrenaline. This is why athletes do this immediately before a world championship race or Olympic final. This is why an executive would do this right before a major presentation.

Ben Greenfield: Oh yeah. That's one of my favorite things, by the way, to have this in my hotel room and do like a body weight workout before I go down to a conference room and give a talk. When I'm at a hotel, it's my go-to workout because I feel like I'm just smarter afterwards. It's like an exercise smart drug.

Steve: Yes. We've done tests at the University of Tokyo Hospital where we placed actually people in MRI machines, have the KAATSU bands on. Of course, they're still, and we actually see within their brain the various small capillaries light up. I mean, it's a little too deep for me as to what the metabolites are being produced. We do know that there are, as we've measured, 460 of them being produced as a result of KAATSU, but it's also very similar if you would do a weight workout or a bunch of burpees or go for a run.

But in this case, in your case, for example, and many other executives, for example, they will do this in their business suit, so they're not sweating. When they do KAATSU, they can do it in their attire that they're going to present in their hotel room. Go walk downstairs and then give a, a killer speech.

Ben Greenfield: Right. Or you could use them, as I've done before, when I'm like outside going on a walk, talking to people, doing consults, doing podcasts, etc. I'll actually – and again, we can return to this and your guys' thoughts on it – do arms and legs, and then just like go for a walk with the things tethered and just maintain that pressure the whole time I'm walking.

And the other thing I wanted to ask you about was you talked about the lactate getting trapped in the muscle tissue. When that occurs, is that what's responsible for the HGH and the IGF I response? And kind of a follow-up question to that, I've also heard some people say that you also see an amplified testosterone response post-workout when you have that lactate trapped in the muscle tissue. But what exactly is going on from an endocrine standpoint with regards to the response of lactic acid?

John Doolittle:

Hey Ben, this is John. I'll let Steven hit the testosterone piece. I actually don't know on that, but I do know, and again, I talk about this stuff in total lay terms. To me, you're essentially tricking the brain into thinking that you're working much harder, and we know that when lactate is in the tissue and lactate is being created, the brain responds accordingly, right?

So, you've got this metabolic stress that's taking place in your legs right now, especially if you're standing, if you're not sitting. Your brain is reacting to that as if it's exercise. If you're moving your legs, even if it's just a little bit, then your brain reacts even more so, right? So, it's tricking you, tricking your brain into thinking you're working just a hell of a lot harder than you are.

Ben Greenfield:

Okay. Now, when it comes to the actual idea here of from what I understand, like an increased satellite cell response or increased mitochondrial proliferation in response to this restriction of blood while training or this engorgement of the blood in the limbs, what exactly is going on there that would allow you to build muscle or to maintain muscle without using heavy weights? Can you guys get into the science of what's going on there?

John Doolittle:

I think a key piece here is the cycle aspect. When you think of what's happening when the bands contract like this, everything distal of the bands is, I look at it as almost like a physical stretching. You're stretching all the way down to the capillaries. You're stretching out open, you're holding it for 30 seconds.

Your machine right now is going 30 seconds on, 5 seconds off, and each time it comes up in pressure, arguably you're stretching capillary tissue, which means you're stretching all that tissue nice and wide open. You're essentially improving blood flow by opening those pipes up some. Does that get to your question?

Ben Greenfield:

So, my understanding is that you get this stimulation of muscle protein synthesis and satellite cell activity that somehow occurring when the blood flow is actually restricted because there's a greater

mechanical tension in the actual muscle belly itself. And when you combine that with the slight hypoxia, the buildup of lactic acid and kind of that acidotic state, the mitochondria in addition to the muscle fibers respond by growing in density. So, essentially what you're doing is tricking the muscle, so to speak, into a hypertrophic state via hormonal trigger and also a blood flow trigger without the same type of cytokine-based inflammatory response that would normally occur when you heavily damage tissue.

So, it's almost like you're sending a signal that would normally be sent during like heavy **E-Center** training or highly inflammatory training, and instead getting that signal sent via metabolic stress and hypoxic stress and some amount of acidic stress without the actual loading, which is why somebody who is, say, injured or elderly or doesn't have access to heavy weights, or even doesn't want to produce like an inflammatory firestorm, which is one reason why I've been using it during this coronavirus thing just 'cause I want as little inflammation as possible while still getting the exercise response.

I think that's kind of sort of what's going on here as far as the actual muscle response of this stuff. And when you look at a guy like Dr. Sato, from what I understand, he's actually kind of developed specific routines that maximize that response. What would be the best way to actually use something like this if someone's goal were, say, muscle gain? Like what would an actual workout look like, or how is Dr. Sato implementing these KAATSU cycles in his own training?

John Doolittle:

So, this is John. We were just in the backyard this morning during this modified lockdown, and we did a Dr. Sato chest and pull workout with KAATSU. He will take, and you look at the guy and it looks like he throws around 300 pounds, no problem, and he can, but that's not how he works out. So, he'll take the 45-pound bar, and he'll do a set of somewhere between 60 and 90. And if he's able to hit those numbers, no problem, he doesn't increase the weight.

Ben Greenfield:

Wait, he'll do 60 to 90 reps in one set?

John Doolittle:

Yeah, with 40-45 pounds, and if he can hit that, no problem. He doesn't add weight, and this is kind of his key, right? He adds pressure, and his reps go immediately down significantly after that first set, but that's how he works. He does very, very low weight and a lot of times, he does no weight.

- Ben Greenfield:* And that's one single set that he's doing?
- John Doolittle:* Correct.
- Ben Greenfield:* Okay. And what about the tempo? Is he doing like super slow training? Because I talked in a recent podcast about how I found some success combining kind of like the Doug McGuff body by science super slow training approach while wearing the BFR bands and found a great deal of efficacy in that. But how exactly is Dr. Sato approaching the tempo piece of things?
- Steven Munatones:* If he's looking at a muscle growth, he'll do three or four sets. We'll just take his arms, for example. He'll do three or four sets, or his chest. The first set he calls priming the pump, and that's where he'll do a large number of sets. Again, if he's on the bench press, he's just using the bar itself.
- No, he's not adding any plates, just the bar itself, and he'll be up, Ben, right about where you are, 350 to 400 SKU we call that or standard KAATSU unit. So, he'll be up there, he'll have 60 to 90 reps. He'll rest only 20 seconds. His second set will probably fall anywhere from 20 to 30 reps. His third set will fall significantly more. He might do anywhere from four to eight and literally the last rep, he'll try to squeeze out one.
- Ben Greenfield:* Okay. So, the muscle is getting more and more fatigued, more hypoxic, more lactic acid between each set. So, his reps are going down, but he's doing the same exercise set after set after set until he gets to the point where he literally is having a hard time just doing a few reps.
- Steven Munatones:* Just doing one. Ideally, he'll go from that high number above 50 to the fourth set, which is one.
- Ben Greenfield:* And how many sets does it take to get from like a 50-rep set all the way down to a set that would only allow you to do like, say, one rep?
- Steven Munatones:* Four sets.
- Ben Greenfield:* Okay. Four sets. And how long a period of rest in between sets?
- Steven Munatones:* Only 20 seconds.
- Ben Greenfield:* Okay. So, it's literally go, 20-second rest, go. I think that's kind of similar to the protocol you took me through, John when, you came

to my house. We had some pullups, we had some rollouts, we had some squats. And yeah, it's incredible how quickly the muscle becomes fatigued when you're using that approach.

Steven Munatones: In addition, so not only does Dr. Sato do these rapid, let's say, bench press and other movements, on every other day he'll do very slow movements on let's say Tuesday, Thursday, Saturday, so he alternates. He is very much an advocate of stressing the body in different ways. So, on one day, Monday, Wednesday, Friday, he'll go at the regular pace that you see most people do a bench press or a squat. And on other days, Tuesday, Thursday, Saturday, he'll go very, very slowly.

So, the workout time will be different. The workout repetitions will also be different, depending on what he's trying to achieve. He originally was a power lifter, then he got interested in his sort of physique. So, he does a variety of exercises. He'll get on the step master some days and just crank them out. He'll go from, let's say, 400 to 500 steps on the first set, he'll go to 50 to 80 on the second set, he'll drop down to like 10 to 15 on the last set, and the fourth set, he'll maybe squeeze out one.

So, that's how he mixes both regular speed and then super slow speed depending on what he does. But it's very interesting. He always starts off with his smaller muscles. So, he'll do, for example, on his arms, he'll work on his forearms first, then go to his biceps, then go to triceps, and then shoulder work. On his legs, he'll start off with his calves, then go up to his upper leg, and he'll always finish a workout with his core. And you might ask, how does he work on his core with the bands on his legs?

For example, instead of doing a plank or a crunch or a sit-up, he'll sit up straight and contract the core, or he'll stand up and he'll balance on one leg. He'll walk with very, very nice posture with the bands after this hard workout, contracting the core. And this is what he recommends to people who have lower back issues, older people, people who, for whatever reason, they don't want to do a crunch. They don't want to do a sit-up, but they can walk with a book on their head or they can balance on one foot.

Ben Greenfield: Well, hello. I want to interrupt today's show to tell you about a website that's owned by a guy who's probably one of my most popular podcast guests that I've had on the show when it comes to water. He's a pioneer in reverse osmosis water technology, well-known figure in the water and the minerals industry, but he has a

website where he's got everything from this plasma that he's developed that has over 78 different trace minerals in it.

He's got hydrogen tablets that, in my opinion, are some of the best hydrogen tablets on the market. I'm actually interviewing him soon on the podcast just about hydrogen because I'm so impressed with its ability to act as like an exercise mimetic, as a calorie restriction mimetic, as an anti-inflammatory. There's so many use cases for hydrogen, and his website Water and Wellness is like your landing pad for all things water.

So, if you want to get a 15 percent discount on anything that Robert has developed on his fantastic water website, you just go to WaterandWellness.com/greenfield and to get 15 percent off, you use code Greenfield at checkout. So, it's WaterandWellness.com/greenfield and the code that you use over there is Greenfield. Of course, you cannot live on water alone. You also need cereal.

And my friends at Magic Spoon, what they've done is they've cracked the code on recreating all of the nostalgic flavors from our childhood, like Fruit Loops and Frosted Flakes and Cocoa Puffs. They have taken those flavors. They've also added in some of their own flavors, like pumpkin spice and birthday cake, which is to die for, turned it into a high protein, low carb cereal, grain-free, gluten-free, keto friendly, and they taste amazing.

My kids have been having a bowl of these for breakfast in the morning. I love it. They've got zero sugar. My kids are getting 12 grams in a bowl of cereal, 12 grams of protein in the morning, and again, the flavors will knock your socks off. Their formulators are just wizards in the whole cereal department. Even the milk is good to drink afterwards, mix a little coconut milk, almond milk. Free shipping on anything from Magic Spoon, any of their cereals. Try the variety pack if you want to try all of them, you'll love it.

It's magicspoon.com and use code Ben Greenfield. They have a 100 percent happiness guarantee, so if you don't love their cereal, which you will, they'll refund it no questions asked. So, grab some Magic Spoon cereal today and find out what you're missing out on, magicspoon.com and use code Ben Greenfield for free shipping.

What are your thoughts on using the arms and the legs at the same time? Because I've heard, you know, some people are concerned about the safety of that. I've found it to be a little bit of a time hack because I'll go back and forth from squats to pushups to lunges to

pull-ups and kind of almost do it circuit style with the bands on the arms and the legs and have swum like I mentioned like that and also gone on walks like that. But what are your guys' thoughts on occluding or on using the KAATSU bands on the arms and legs simultaneously?

John Doolittle: Well, you know, our primary core market is people in their 60s, 70s, 80s. I mean, our oldest client is 104 years old. You know the deal, Ben. They're not studs like you. We don't want those people putting bands on four limbs at once.

Ben Greenfield: Why?

John Doolittle: Well, there's a potential for them to pass out.

Ben Greenfield: So, it's not a blood clot issue. It's more a matter of just your blood pressure, would it be your blood pressure dropping to the point where you would pass out because the blood is occluded or is not occluded, but is relatively concentrated in these limbs?

John Doolittle: Yeah, I mean, you slow down the venous return enough on two limbs and you definitely feel it just like you're doing right now at your desk. You do it on all four limbs, while you can handle that, a lot of people can't. So, it's a safety thing.

Ben Greenfield: Okay. It's just safety. Gotcha.

Steven Munatones: We definitely don't recommend anybody doing this. However, there are some occasions when you do use it on the arms and legs, but they're very rare. We want to make sure people understand that when we say, hey, you can be a professional major league pitcher, put them on your arms, put them on your legs, and throw three or four fast balls, but that's not your average 40 to 60 year old executive.

You can be an NBA power forward, put them on your arms and legs, take maybe two or three free throws or three-point shots. You are smoked. After you're smoked, then you can take off an arm. That's what we recommend first. Then go to the legs. Next, smoke your legs, and this is the really, really key point of KAATSU for people who are performance athletes.

Do the **cots** cycle, then do the cots training, goes through your exercise, whether that's a batter, a batting, a golfer using their golf club or a basketball player shooting some three-point shots. After they've smoked, rest a bit, hydrate a bit. Then go back to that same

exact exercise. It could be a 100-meter dash runner working on his starts or that a power forward working on his jump shot. After cots is over, then repeat that same movement and really hit that free throw. Really hit that drive. Really come barging out of the starting blocks really hard.

Because you've got this sort of euphoric feeling of KAATSU, it's a perfect time for an athlete really to get psychologically as well as physiologically ready to have a great vertical leap or have a great start out off the blocks and into swimming world. Same thing working on that stroke. If you're a rower, you know, finishing off the last 500 meters of a race. So, cots is integral into a training program, whether you're a CEO of a Fortune 500 company gonna make a speech.

The speech is your product, but that KAATSU helps warm you up. In the same way for the athlete, once they integrate the KAATSU portion of their workout, go back to what they're working on, whether it's a gymnast, a runner, a triathlete, etc., and then do that same motion in a very euphoric state with your body and your capillary beds fully engorged, and you can really see the performance gains in this case.

Ben Greenfield: Yeah, and from what I understand, there are a lot of pro teams now utilizing this. Is that correct?

Steven Munatones: Correct. Everybody from NFL quarterbacks to major league baseball stars. And actually, the first, one of the first guys that used it that really sort of kicked us off in the pro sports world was the power forward for the New York Knicks.

John Doolittle: Carmelo Anthony.

Steven Munatones: Carmelo Anthony. Yeah. So, he was looking at it for rehab because he wanted to go to the Rio Olympics in 2016. We went down there with our first-generation product, we call it cots nano, and after the Olympics, we really didn't follow up too well with him honestly speaking.

Then all of a sudden, about two months after the Olympics, we started getting orders from NBA teams, guys all over the place. As pro sports works, NBA guys know NFL guys, NFL guys know major league baseball guys, major league baseball guys know NHL guys, and the word spread from there.

Ben Greenfield:

Yeah. You guys touched on some things that I wanted to comment on. First of all, the longevity piece. I was speaking with my friend, Dr. Mercola, who is huge on KAATSU. He's a huge fan of KAATSU. He actually had mentioned that it may increase circulating NAD levels, which we know decline with age and which we know are very protective for the mitochondria. So, there might be something going on with NAD from a longevity standpoint. That was one thought I had when I was thinking about Dr. Sato. It'd be interesting to see what his NAD levels are, even though testing is kind of iffy as far as accuracy.

That's one thought that came to mind. Another thought that came to mind is it's interesting how he's doing slow but also explosive training with the KAATSU because you know, I talk about this in my book *Boundless*. If you look at muscle fiber composition, it's these fast twitch, particularly these type 2A muscle fibers that respond to explosive training or plyometric training that seems to be more correlated with longevity than just muscle mass overall.

So, this idea of incorporating, in addition to super slow training, more of the explosive body weight training, I think is a smart idea if you're going to use these BFR or these – I should actually ask you guys if BFR is synonymous with KAATSU or not. We can maybe address that in a moment. But when you're using these, using different modalities as you guys have described, which is why I'm using it for walking and swimming, I'm using it for these more explosive body weight workouts, but then I'm also doing some more super slow training, either with lightweights or with body weight.

And I think that's another important component is working in multiple modalities with these. Another thing that came to mind was I actually sometimes wear this app called a Nature Beat with a heart rate monitor when I'm training to gauge sympathetic stress, because if I can identify the modalities that induce the greatest amounts of sympathetic stress, then that means that those are the things that go into improved vagal tone and post-exercise HRV the most.

And I've talked before in the podcast about how back squats and deadlifts seem to be two things that vastly increased my sympathetic activity and drop my HRV during training. Turns out when I wore my HRV strap when I'm doing the KAATSU training, it actually significantly lowered HRV and increased sympathetic activity, this so-called low frequency score on the HRV app. So, I think there's something going on from a nervous

system standpoint as well. Have you guys come across anything regarding like vagal nerve tone or HRV in response to KAATSU training?

John Doolittle:

Ben, we definitely have seen some turning on of the parasymp – see, one of the things we've been dealing with in **SOCOM** ever since, that's Special Operations Command, ever since 9/11 is so many guys are getting stuck in this hypervigilant state. They're stuck in that sympathetic mode, and so anything that's out there in the emerging technology world that can help guys get back into their parasympathetic state or engage that vagal and just help them sleep is valuable, and there's absolutely shown in the various research studies, KAATSU can turn on the parasympathetic aspect in the human body.

It actually helps people sleep. Dr Sato and Steven could probably talk to this better than me, but Dr. Sato actually has an insomnia protocol. And if you do this stuff like arm cycles, which is really, really light stretching, really slow movements in your upper body, within an hour of going to sleep, bam, it, really helps out.

Ben Greenfield:

Interesting. And then one last thought, and then I want to ask you about the difference between a BFR and KAATSU, and that is, this may have been in the book. What was the book that you gave me, John, to read about KAATSU when you came to my house? Do you recall the name of that book?

John Doolittle:

Oh yeah. the one with, our German researcher, Robert **Hyduck's** book.

Steve:

It's called *KAATSU: The Pressure Training from Japan*.

Ben Greenfield:

Yeah. Okay. So, I found that book fascinating. But one thing they talked about in that book is this concept of doing multiple workouts per day. I think it was in that book, or it was in looking over Dr. Sato's protocol, because the training sessions don't take that long. I've personally been able to come back day after day without soreness and even do like a leg workout and an arm workout when I was experimenting with just the legs and just the arms in a single day.

But is that something Sato does or that you guys have seen incorporate this idea of like micro workouts where you might have a 15-minute workout in the morning using the KAATSU, a 15-minute in the mid-day and then like another 15 minutes in the evening? Is there something to that idea?

John Doolittle: So, the way it was explained to me, and it makes sense. I spent a career dealing with DOMs, right? You get these delayed onset muscle soreness, you do a heavy workout. You get this inflammation response, and then you got to lay off that muscle group for two or three days. That's kind of been the way we've done things for a long, long time. When you do KAATSU with very, very low weight, or by definition, light intensity, when you're working at 80, 90 percent one rep max, you're, I mean, and I'm more asking you, Ben, but I understand that you're tearing muscle fibers down and then you get an inflammation response and your body has to take time to repair that.

When you're doing KAATSU, I don't think you're getting nearly that, if any, because you're only working it 10, 20 percent one rep max, sometimes even less 'cause you're just doing a lot of body weight type movement. So yeah, I would agree. You absolutely can get after it multiple times. Gone are the days of, hey, I'm going to work legs hard today and I can't do them again for three or four days. You can do them again the same day or the next morning, no problem.

Ben Greenfield: Okay. And then one thing I wanted to mention, it sounds like you wanted to jump in, Steven, but really quickly and then we can come back to this if we need to, a couple of times during this show, I've said BFR and corrected myself and said KAATSU. Can I use those terms synonymously?

Like if we were to take BFR, KAATSU training, and occlusion training, I think we've established that because there's venous return occurring that this would be different than occlusion training or tourniquet-based training. But what about BFR training? Can that be used synonymously with KAATSU training?

John Doolittle: No, it shouldn't be, because when you're doing BFR training, you're doing by definition occlusion training, and Steven will go into the, the history of how we got there, why that term BFR is even out there. But when somebody takes you through occlusion training or BFR training, they'll bring the limb to a full occlusion and then they'll back it off a percentage. And our approach is completely different.

What Dr. Sato has spent essentially his entire adult life refining is that very, very gradual increase, and if you can handle that, you release and you go a little more and then a little more and then a little more, and you're never, as we talked about earlier, you're

never, ever getting to that full occlusion. BFR goes full occlusion, backs it off. KAATSU starts very, very gradual and never gets to occlusion, so it's a much safer approach.

Ben Greenfield: Okay. Got it. And Steven, it sounds like when we were talking about protocols there, you were going to jump in and say something?

Steven Munatones: Yes. Going back to this slow training, slow movement and explosive movement, this is very critical in anything we do. So, for example, let's take the case of an NBA power forward who wants a greater vertical leap or a volleyball player who wants a greater vertical leap. Well, I actually asked that athlete to put the cots bands on and then go through the cycle program, which is pressure on pressure off, pressure on pressure off, gradually increasing so their limb is totally engorged in blood at or as much as possible.

Then we'll ask that athlete to go very slowly. So, for example, some slow quarter squats. Don't lock the knees, just up and down, up and down quite slowly. When they burn out there, then we'll ask them to move explosively. Okay, jump high to block that volleyball or jump high on that jump shot, jump as high as you can. Then we burned that out and then we asked them to take off the bands and then perform as they normally do in their workout.

That kind of a change in stress from just sitting, engorging the capillary beds in blood to slow movement and then to explosive movement, and then back to their normal activity, we see the best and optimal performance gains there, and it doesn't matter. It could be a boxer, MMA fighter, a gymnast, a golfer of any age, teenager to, you know, older guys. It could be racewalkers, marathon runners. This is what we advocate and this is what Dr. Sato has always seen.

Ben Greenfield: Okay, so again, this is important and I want to make sure people get this. You're saying you're doing your movement protocol with the bands and reducing the pressure, then coming back and hitting it again?

Steven Munatones: In some cases, you're not reducing the pressure, you're just actually reducing the volume or the intensity. So, for example, a runner would run, well just put it very simply, a runner would run at a let's say one-minute pace for 400 meters the first time. The second time, they won't be able to maintain that pace. They'll actually go slower. They'll maintain the pressure.

However, when the athlete can continue to maintain the pressure at a one-minute for 400-meter pace, at that point, then we increase the pressure very slightly. We basically imagine I'm running at a four mile per minute pace at sea level. Then trying to run a four minute per mile pace at 500 feet, then at 1,000 feet, then at 1,500 feet, etc. Because that, as you mentioned before, the hypoxia part of this is also very, very critical for performance gains.

And why is this important? Dr Sato, initially, when I first met him, again this is the early 2000s, we had been working or he had been working with the cardiologist with over a ten-year period, 7,000 cardiac rehab patients. Now, those are people generally between the ages of 50 and 80, and he could not push these people hard. He wasn't asking these people to do a bench press, even a pushup. These are people who just had a heart attack, just had a stroke, had heart bypass surgery.

And as they're being rolled out from the operating room, they were putting bands on them very, very lightly, and doing passive movement. So, the nurse or the therapist would actually be moving the limb with very, very light pressure. And during this period, we learned how the body best responds, and again, we were dealing with people who were in a very vulnerable state. They had just come off of a heart attack. They were 65 years old with diabetes.

So, the pressures we were talking about were very, very low, and they were obviously getting tired. Their muscle would start to quiver even if we were moving their arms or their legs. From that point we learned, well, if we could do this with very, very vulnerable, very, very weakened people, we could obviously do that a lot more with very fit people and very fit all the way up to Olympians and pros.

So, this is why this change in mechanical stress from slow to fast, from explosive back to, you know, regular speed, if you will, from a low pressure to high pressure. And then you try to sustain that performance level at a certain very high pressure, and high could mean in your case, in Dr. Sato's case, 400 SKU or millibars of mercury.

Ben Greenfield:

I've been using 350 to 400 for most of my workouts.

Steve:

And I would expect that for a person of your fitness, your age, etc. What Dr. Sato would like to see someone like you do is to maintain that pressure until you're 60, 70, 80, 90 years old, and that's the goal. We want it just as, you know, athletes train their

bodies, as writers and speakers practice their own cognitive skills, Dr Sato and we want people actually to practice their vascular system or train their vascular system throughout their life. That's the entire goal of KAATSU. It's more of a vascular training that it is muscular training.

Ben Greenfield:

Right. Although you're getting a pretty significant muscular effect. The other thing that I find quite interesting is the potential effect on the immune system here, which is of course, again, pretty relevant to the times that we are in with this coronavirus pandemic going on.

We know that the nitric oxide release that you guys talked about, the production of the vascular endothelial growth factor and the nitric oxide, which allows blood vessels to constrict and relax and regulates inflammatory cells in the blood vessel walls is of course great for overall cardiovascular function. But then when you look at there's some other things released like some plasmalogens and ceramides and even the growth hormone release that I think may have an impact on immunity.

But in particular, the FDA, just a couple of days ago, they actually allowed for the granting of this thing called an **Inopulse** for the treatment of COVID-19, which is essentially a machine that allows for increased production of nitric oxide via inhaled nitric oxide. And the reason for that is because it turns out that nitric oxide has some pretty potent antiviral effects, meaning that there are studies that show that nitric oxide inhibits the replication of SARS Co-V.

And there's a few other studies that show that this increase in what's called flow mediated dilation can also increase the activity of endothelial nitric oxide synthase in the human body, both of which occur in response to this blood flow restriction training. So, I think there's something going on here from an immunity standpoint, but I'm just curious, for you guys, I know you're probably both on quarantine as well, have you been kind of stepping up your use of these things just so you get that nitric oxide response? And if so, are you also doing anything else like in combination with your KAATSU training to kind of amplify that nitric oxide response?

John Doolittle:

So, on our end, we have a family of five. We've got three teenagers, 17, 15, 13, and Katie and I, and we all use COTS. We primarily use the cycle mode when we're going for walks at the end of the day, so we'll walk the dogs and whatnot. And again, Ben, you know, I don't have the background to talk to a lot of the

specifics that you're mentioning, but I am seeing a lot of studies that talk about hypoxia in the tissues, that talk about nitric oxide in the tissues, specifically the endothelial nitric oxide synthase.

I guess there's three or four different types of NO, but the ENOS, the endothelial nitric oxide, every time you do a cycle, 'cause right now you're doing cycles on your machine. You're not doing that sustained pressure. Every time you do a cycle, all that tissue, it expands and then you get that rapid complete release and then it relaxes.

Each time the tissue in the vascular walls move like that and create this, it's almost like a shearing movement that's taking place primarily in the veins and the intravenous tissue, each time that happens, endothelial nitric oxide synthase is being released in the body. Now, combine that with the hypoxic piece that's taking place in the tissue, and yeah, there's some significant immune response stuff going on. I'm not even going to pretend to talk about it like Dr. Mercola, but it's pretty significant from our understanding.

Ben Greenfield:

And how about you, Steven?

Steve:

Yes. Japan actually was hit with this pandemic before the U.S., most people in America were even aware of. And Dr. Sato called immediately and encouraged all of us who are KAATSU users to do it at least three times a day, which speaks to your previous comment that you can actually use this multiple times a day easily. So, in my own case, I have four children. They're high schoolers, they're college students, and they're young working adults.

They were all either put on a work from home basis or their schools were canceled for the time being. So, they're all home. So, they're all doing online schooling, or three of them, and the other one is working from home. As they are literally watching their teacher give them a lecture or doing their homework, they have the bands on their arms or their legs. They're doing KAATSU.

And then at 2:30, we set up a program for our local high school. I think we have 24 kids who have KAATSU bands on and we all get on Zoom and we all do a workout together. The workout is led by one of the teachers who's a coach. We do everything from tricep dips to stretches to different kinds of isometric holds, etc. It's a good way for the kids to release. We are in a shelter in place location.

And then in addition to that, my wife and I and my parents who live nearby, my father is 84, my mother's 82, they do it three times a day. They walk around their complex at their own pace. And we strongly encourage everybody to do KAATSU during this period. Dr. Sato's first warning back in, I think it was a second week in January when Tokyo was first aware of this was, you know, we want as strong an immune system as possible and COTS is a big part of that, that anybody could work in, in the course of their day, whether they're a student in front of their laptop or a husband and wife going to walk the dog in the evening.

Ben Greenfield:

Yeah. And what I've found is for me, since I'm visiting the sauna so much, I'm also in the cold pool a lot, I can put these on for my kind of like flow yoga that I do in the sauna in the morning, which is going to result in a nitric oxide release anyways, and then I just trudge through the yard with the straps still on. Again, I'm breaking the rules. I got the arms and the legs on at the same time, but I walk through the yard. I jump in the cold pool. I go back and forth in the cold pool a few times. And so, I'm using it for that.

Again, like I mentioned, I'm doing some training on the Aerodyne with it, and then I'm doing a lot of body weight, kind of like circuits with it, and then also a little bit of the super slow stuff, either with lightweight or with bodyweight. Now, I think one of the best studies that I have seen, and from what I understand, this is the one that really induced the Chinese Olympic team to begin using KAATSU pretty extensively with their athletes.

I'm going to link to in the show notes because it shows a reduction in body weight, BMI, and body fat percentage. The increase in the vascular endothelial growth factor, nitric oxide, which we talked about, which is fantastic for vascular tone and for improving endothelial function. But even a few other things happened that we didn't even talk about on today's show, like lipid metabolism. They showed an intense rise in lipoprotein lipase and pyruvate dehydrogenase, both of which are crucial for blood lipid metabolism.

So, there was a direct cardiovascular effect from a lipid standpoint, and then that PGC1 alpha is also another thing they found increased, and that's part of the mitochondrial response as well as the drop in blood and oxygen availability that we already talked about. And then they found an increase in power, which is surprising, an increase explosiveness in power because you wouldn't expect that with this type of training. But they observed that in this study after eight weeks of KAATSU training.

And then, the very interesting thing, like I mentioned earlier, is all of this occurred without KAATSU causing the surge of inflammatory cytokines and the emergence of muscle injury. So, basically, the muscles are growing with a completely different mechanism of action or relatively different mechanism of action than what you'd expect under normal circumstances. So, I mean, it almost sounds like cheating when you're using these things, but it really is pretty profound.

I first learned about this mildly, when I was doing the bodybuilding training and just using tourniquets, and then I think I used my first KAATSU device when I was training with Aubrey Marcus down at **Ona**. He and I did a little workout, I think right after he got a device. I'm just blown away at how pumped my muscles were after, and my biceps seemed like they were twice the size the rest of the day.

And then since John came up to my house, I've been using this KAATSU device quite a bit. And man, it's just, it's nuts. It's extremely cool though what this stuff can do. And, if any of you listening in, get a chance to try a KAATSU device. Even if you've used the blood flow restriction bands, the tourniquets off of Amazon, for example, this thing with the handheld unit that kind of cycles the pressure and does exactly what Dr. Sato is doing and what a lot of researchers are doing with, say, true KAATSU training, it's a totally different effect.

And again, like I mentioned, you can take the motor control device off and use it in what's called untethered form, so you can really get it up to however many millimeters of mercury you want and then untether it and just go off and do your workout, which John showed to me and which I also thought was pretty dang handy again for things like walks or even just hanging out at your desk working.

Like literally, this whole time, you guys probably heard this, I hope it's not driving my listeners nuts, you can hear this motor going, just cycling blood at about – I'm on high, so it's cycling between about 330 and 360 just in and out of my legs this whole time. So, it's a very cool device and I think, do you guys have like a discount code or anything like that for my audience to use?

John Doolittle:

Yeah, discount code BEN, just capital B-E-N.

Ben Greenfield: And what does that get people? What does that save them?

John Doolittle: Oh, that's 5 percent off the _____.

Ben Greenfield: So, 5 percent, which is actually pretty significant on one of these devices, because they are more spendy than the tourniquets you get off Amazon. But again, this is high tech stuff out of Japan, these KAATSU devices. So, I'll put that link and that code in the show notes for you guys. And then, John and Steven, anything else you guys wanted to mention? Anything you didn't get a chance to highlight as far as any key research studies or developments in this that you wanted to bring up.

John Doolittle: You know, my background is in the military and the veteran community of course. And while I've been – I totally believe on what this can do for athletes, elite athletes and whatnot, a lot of times those changes on those type of people are small changes and small change can be really valuable. But the exponential changes on guys that are dealing with spinal cord injury, guys that are dealing with massive, massive TBI where neuromuscular control has been lost.

The anecdotal evidence and findings and outcomes that we're seeing with our vets are absolutely incredible. I mean, I'll just take this opportunity to talk about real quick Joe Lowry, seven special forces group, a guy shot with a PKM round in the head. Right side of his head, left side completely paralyzed. Went through a lot of rehab, but he was essentially paralyzed. But because it was a brain injury, right, not a spinal cord injury, something with the autonomic nervous system, we were able to help get things turned on, on his left side.

So, he still uses a chair, but he's taking over 3,000 steps with a cane per day. That's life changing stuff. Another seven special forces group guy Romy Camargo shot in the neck, shattered his C3. They had to remove his C3 through and through his spinal cord. Complete quad, complete severed spinal cord. But Romy is dealing with neuropathic pain in his feet and on all kinds of meds and lower extremity circulation issues.

Well, his therapist used KAATSU to help improve circulation in his lower extremities, so when he does KAATSU cycles before going to bed, the neuropathic pain, something with that autonomic nervous system, I'm not smart enough to understand how, but it's making a difference. It's making that neuropathic pain help go

away without drugs. Non-drug, noninvasive, some pretty, pretty incredible stuff for our wounded, ill, and injured.

Ben Greenfield: Wow. So, huge, huge application here in physical therapy. I dig it. Steven, any last comments or thoughts that you have for folks?

Steven Munatones: Yes, I'd like to address the BFR versus KAATSU and where that actually came about. Right about the time that the initial research was being done, the editors of the scientific journals, which Dr. Sato and his colleagues at the University of Tokyo Hospital were submitting their papers, the word "KAATSU" was not known. And so, in a back-and-forth with the journal editors, they came up with the word "vascular occlusion" or blood flow restriction.

And so, it was actually in the middle of the submission of papers where KAATSU actually transitioned because it was a Japanese word to this English vernacular, which then became the BFR acronym. And that was late 90s, early 2000s, that that occurred. And then, concurrently to that, and this is where I entered the picture, the Japanese had started a 22nd century project, and that was a project started in 1999 to look forward 100 years, and Japan had forecasted, which is occurring right now, that their population would be decreasing, and the percentage of older people older than 65 would just dramatically increase.

And they knew they had to do things very dramatically and radically to keep their population healthy and productive throughout the 21st century, again, looking toward the 22nd century, and one of those technologies was KAATSU. And so, in the midst of all of this, Dr. Sato and his colleagues and I was part of this team there were looking at ways, how do you keep the muscularity, the vascularity, and then also the aerobic capacity of this rapidly aging population of Japan, to improve?

And so, all of these things were happening all about the same time. It has applications for, again, working adults and high-level athletes. So, I wanted to mention that.

Ben Greenfield: Well, I'm certainly sold on it. I'm actually putting mine, I've got about a 15-minute break here before my next call, and so, I'm putting both my arms and my legs here – let me press my button – on a 400. I'm going to go tool around the house, grab a drink. I get this podcast uploaded while I've got 400 on the arms and legs, and I go untethered mode, and I just get a huge pump on and then go about my day all swole.

John Doolittle: Don't pass out, Ben.

Ben Greenfield: Don't worry, dude. You guys will kill me for this, but I've actually worked out with both the arms and the legs on 400 for a 60-minute workout before, and it's a pain cave workout, but sometimes I like to be extreme and take things to the limit. So, warning to listeners, follow the rules, unless you're a masochist like me, and proceed at your own risk if you are. But this stuff's pretty cool.

And I'm gonna link, if you go to BenGreenfieldfitness.com/KAATSUpodcast, to everything that we talked about in today's show from the previous podcasts I've done on this topic, to the KAATSU devices themselves with the discount code that John's given us to some of the cool studies, the book that I read on this.

We'll include some photos of Dr. Sato and everything else that you guys need over at BenGreenfieldfitness.com/KAATSUpodcast. John and Steven, thanks so much for coming on and doing this episode. I've always wanted to kind of geek out on this stuff and it was fun to do so with my legs absolutely pumped, and now my arms are just jacked right now. They've only been on for like two minutes. So, I'm gonna go and I'm going to crank out some quick household chores and get my workout in, fellows.

John Doolittle: Hey, thanks Ben, and honored to be on your show. Thanks for everything you're doing. It's really making an impact for a lot of people.

Steven Munatones: Thank you very much. It was great.

Ben Greenfield: Thanks for coming on, fellows, and folks listening in, until next time, I'm Ben Greenfield signing out from BenGreenfieldfitness.com. Have an amazing week.

Well, thanks for listening to today's show. You can grab all the show notes, resources, pretty much everything that I mentioned over at BenGreenfieldfitness.com along with plenty of other goodies from me, including the highly helpful Ben Recommends page, which has a list of pretty much everything that I've ever recommended for hormones, sleep, digestion, fat loss, performance, and plenty more.

Please also know that all the links, all the promo codes that I mentioned during this and every episode helped to make this podcast happen and to generate income that enables me to keep

bringing you this content every single week. So, when you listen in, be sure to use the links in the show notes. Use the promo codes that I generate because that helps to float this thing and keep it coming to you each and every week.

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